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Data for a 4-year study of psychological traits were obtained from more than 300 male and 150 female national merit scholars and certificate of merit recipients on the Omnibus Personality Inventory, the Allport-Vernon-Lindzey Study of Values, the Meyers-Briggs Type Indicator, and a questionnaire. The traits included values, attitudes, and intellectual dispositions which may affect the educational process and in turn be modified by students' educational experiences. The Omnibus Personality Inventory, taken before the students entered college and again 4 years later, revealed that the students felt more socially acceptable as seniors than as freshmen, and that during the 4-year college period they tended to become more tolerant and less conventional and dependent. The Allport-Vernon-Lindzey Study of Values was administered at the end of the freshman year and again 3 years later. For both sexes, there were significant increases over the 3-year period on the Theoretic and Aesthetic scales, and significant decreases on the Economic and Religious scales. Significant changes in opinions were revealed by questionnaire results between the end of the freshman and senior years. Analyses of the results on the Meyers-Briggs Type Indicator, which was administered at the end of the senior year, are in progress. (WM)

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A FOUR-YEAR STUDY OF PERSONALITY TRAITS AND VALUES OF A GROUP OF NATIONAL MERIT SCHOLARS AND CERTIFICATE OF MERIT RECIPIENTS

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In recent years, educators and psychologists have been increasingly interested in talented, gifted, competent, and creative students. Also, they have turned their attention to psychological traits other than those of academic aptitude and achievement and hence are increasingly investigating such non-intellective characteristics as values, attitudes, and intellectual dispositions which may affect the educational process, and which, in turn, may be modified by the students' educational experiences. These two streams of interest were combined by Professor McConnell when he sought and received permission from Dr. John Stalnacker to conduct a longitudinal study of the first group of students to receive scholarships from the National Merit Scholarship Corporation. To this group of 504 students were added another 430 obtained by selecting every 10th name in the list of Certificate of Merit Winners. About 900 of these students indicated their willingness to respond annually to a battery of tests, inventories, and opinionnaires. Over 90 per cent of the students returned the first set of materials. The numbers declined from one year to the next, but we have rather complete data from a four-year follow-up of over 300 men and 150 women. For certain of our analyses we have larger numbers, but in general we are studying more intensively those students for whom we have complete data.

For present purposes it will be possible to indicate briefly some results which apply to the total group, although in one or two instances we will refer to such subgroups, as, for instance, the smaller groups obtained by classifying students according to their major area of specialization. The data were obtained by administering the Omnibus Personality Inventory, the Allport-Vernon-Lindzey Study of Values, the Myers-Briggs Type Indicator,

and an opinionnaire. The Personality Inventory was taken just before the students entered college and again four years later. The Study of Values and the opinionnaire were administered at the end of the freshman year and again three years later. The Type Indicator was used only once, at the end of the senior year.

The Omnibus Personality Inventory

The Omnibus Personality Inventory was specially prepared for use at the Center for the Study of Higher Education by John Darley and Martin Weisman, following their systematic analysis of the items that appear on many widely used personality inventories. This version of the OPI consists of 13 scales, 4 of which are taken from the M.M.P.I., viz., Hy, Pd, Sc, and Ma.

Webster reported that Vassar students increased their scores along these dimensions from their freshman through their senior year of college. He proposed, in broad terms, that the increase in scores meant that the senior women acknowledged the presence of more psychological and physical disturbances than they had as freshmen. Our data do not reveal this trend. For the men only, there was an increase on the Hy scale, from which we infer that these students were more able to give vent to their feelings as seniors

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1. Hy - enthusiastic and socially uninhibited;
2. Pd - somewhat moody and socially unconventional;
3. Sc - feelings of social alienation;
4. Ma - somewhat impulsive, active, and tense.

than they had been as freshmen. For both sexes there was a decrease in the mean score on the Sc scale - that is, these students seemed to feel more socially acceptable as seniors than as freshmen. This change seems to be consistent with that reported by Jacob when he wrote that "The impact of the college experience is rather to socialize the individual - - - - - so that he can fit comfortably into the ranks of American college alumni" (p.4).

Significant changes occurred on those scales which seem to be related to what may be termed "intellectual disposition," including tolerance, independence, originality, interest in ideas. That is, for both sexes, there was a significant increase in mean score on these three scales:

1. Thinking introversion - a liking for reflective, abstract thought;
2. Complexity of outlook - independence and unconventionality.
3. Originality - independence and freedom of expression. *

At the same time there was a significant decrease on the scales of Fa, and Sm; these changes signify that during the college years the students tended to become more tolerant, less conventional, less dependent. The mean scores on another scale, impulsivity, changed in a direction that suggests that these students become more impulsive, more able to express their feelings without the concomitant appearance of difficulties in personal relationships or in feelings of social alienation.

According to a number of investigators, seniors tend to be more homogeneous than freshmen - at least in some characteristics. Our data do not reveal this trend for the traits measured by the Omnibus Personality Inventory. The variability of the students' scores did not decrease over the four-year period, and indeed the range for four scales showed an increase:

for some traits students were more heterogeneous as they left college than they were when they entered.

There is a tendency for students' scores to show some degree of stability when compared with the scores of the other members of their group, as indicated by test-retest correlations that cluster in the low .50's. On the other hand, correlations of this magnitude mean that the scores for some students, relative to the scores of others, vary considerably from the first to the second testing. By means of a formula derived by Dr. Harold Webster, we have been able to pick out those individuals whose scores changed "materially" over the four college years. We find marked changes for large numbers of students on each scale, the percentages varying from one scale to another. The next step in this part of our analysis will be to look for characteristics that distinguish "changers" from "non-changers."

We have compared the test scores of students in a number of different subgroups. For instance, we find that the mean scores on several scales vary from one major to another. In general, the students in engineering have less liking for ideas, less interest in reflective, abstract thought than have those in the physical sciences. Also, the engineers tend to be more conventional and dependent, and less likely to feel comfortable in dealing with ambiguity and uncertainty. These conclusions apply to the students as freshmen and even more so to them as seniors. At the same time, it should be noted that the means are lower for NMS students than for any other group we have tested.

Five factors were extracted from the tables of intercorrelations of

the scores from each administration of the Personality Inventory. In general, the first-year and fourth-year factors are similar; and the patterns of loadings for the men are much the same as they are for the women. Four factors have been termed Impulsiveness, Tolerance-Complexity, Alienation, and Evasion. The fifth factor was difficult to identify.

The Allport-Vernon-Lindzey Study of Values

The AVL was administered at the end of the freshman year and again three years later. The scores for the six scales of the AVL are not independent for an individual, so for our purposes we deleted one scale from certain statistical analyses, thus removing the restriction on the scores that could be obtained on the other five. The mean scores for our academically superior students differ from those reported for the normative subjects, the means being larger for our students on the Theoretic and Aesthetic scales, and smaller on the Economic scale. In agreement with other reports, we also find significant sex differences, the men scoring higher on the Theoretic, Economic, and Political scales, but lower on the Aesthetic and Religious scales. For both sexes, we have significant increases over the three-year period on the Theoretic and Aesthetic scales, and significant decreases on the Economic and Religious scales.

Theoretic and Aesthetic are two scales which are presumed to measure diametrically opposed values by certain psychologists who also postulate that conflicts will be produced when both these values are high - except that the "creative" individual may be able to tolerate or adjust to the conflict. We find that many of our students (21 per-cent of the men and 23

per cent of the women) had their two highest scores on the Theoretic and Aesthetic scales. Since several of the scales on the Omnibus Personality Inventory give evidence about personal or social adjustment, we compared the mean OPI scores of our freshmen who had high scores on the Theoretic and Aesthetic scales with those of the rest of our subjects. There were no significant differences. As seniors, the students with high Theoretic and Aesthetic scores scored higher than the others in Complexity of Outlook and Originality, and lower on the two scales measuring authoritarian attitudes.

In any case, we wonder whether it is necessary to assume that subjects with high scores on both these values do necessarily experience tension and conflict. Aesthetic experiences may have Theoretic overtones, and Theoretic experiences may involve Aesthetic factors. Systematic observation and reasoning - components of the Theoretic value - may be important characteristics of the English teacher. And the Chemistry teacher may be aesthetically gratified as he systematically and enthusiastically unfolds a complex chemical theory for his students.

Again, as in the case of the scores from the Omnibus Personality Inventory, we do not find a significant increase in homogeneity during the college years. Indeed, for several scales the second variances are larger than the first. These results are in contrast to Jacob's conclusion that "There is more homogeneity and greater consistency of values among students at the end of their four years than when they begin." The Test-retest correlations are in the neighborhood of .60, implying some stability, but also considerable variability, in the student's scores relative to the scores of the other

students. These correlation coefficients are quite similar to those reported by Kelly in his longitudinal study of personality changes over a twenty-year period.

Because of the nature of the AVL, it is possible, and possibly preferable for certain analyses, to rank a student's six scores from high (1) to low (6). This was done for each student and for each administration of the test. The ranks for each scale were then summed and averaged. Similarly the mean scores for each scale were ranked. The two sets of ranked profiles are often quite dissimilar.

The second highest of the mean raw scores for first-year engineers was on the Religious scale which was the fifth highest mean raw score in the profile three years later. On the other hand, we find the reverse condition when we deal with the ranks of average ranks rather than with ranks of mean raw scores. That is, for first-year engineering students, the rank of the averaged ranks on the Religious scale was the second smallest among the six values, but it was second highest three years later. What has happened to the Religious value during the college years? Some evidence may be obtained from the opinionnaire which was administered at the same times as the AVL.

For example: In what way has your attitude toward religion changed since college entrance?

Twenty-seven of the engineers, responding at the end of their first-year, said they valued religion more, 3 said less. Three years later 19 said they valued it more, and 12 said less. It seems that there is a de-

cline in the values attached to religious beliefs. Also, one of the scales of the Omnibus Personality Inventory is related somewhat to the question of religious beliefs, and the mean score of the engineering students declined on this scale. Apparently there is some tendency for those students to reduce their attachment to religious beliefs. Such a conclusion is in contrast to Jacob's contention that religious beliefs and values are "remarkably persistent through college." Analyses similar to those mentioned for the engineering students are being made for all students and for students in other majors.

Opinions

A series of questions concerning opinions on a variety of topics was administered on several occasions, the present analysis being restricted to the results obtained at the end of the freshman and senior years. An extension of McNemar's chi-square test for change was used to test for the significance of change in responses. Significant changes were found for one half of the seventeen items considered. For six of these questions the direction of the change was the same for both men and women.

There was an increase in the number of students who

(1) thought the government should provide medical and dental care for citizens who cannot afford such services.

(2) thought the U. N. was ineffective in establishing conditions for a peaceful world.

(3) denied that the scientist who makes the most significant contribution to society is the one who puts theory into practice.

(4) thought that the process of propaganda is becoming increasingly pervasive.

(5) denied a need for belief in some religious faith.

(6) rejected the notion that American colleges should give greater emphasis to the teaching of religious values.

Considerable stability was found, but significant changes did occur. For instance, consider the question: Do you need to believe in some religious faith? There was a significant shift in the responses, and yet only about 25 per cent of the men changed their response. About one half of them gave a "yes" response as freshmen and again as seniors. Nearly 60 per cent of the women responded "yes" on both occasions, although there was a significant change from the "yes" to the "no" categories. Apparently an adequate consideration of questions about changes in religious values will require that we take into account the frequency of both change and stability. In addition, we may learn more about changes in opinions when we study individual students - both their test scores and the interview data.

Case Studies

As we were looking at data for individuals we identified two men who had very high scores on the Theoretic scale, with quite low scores on the Aesthetic scale. This picture is not typical for this group of academically superior students and hence attracted our attention. We next noticed that the grades for one student were very high, while they were much lower for the other one. We then discovered that they went to the same college, and majored in the same subject. Both had rather low scores for Religious values, and these decreased further from the first to the fourth year.

Their Scholastic Aptitude scores were very high. One graduated in the top 10 per cent of his class and the other one was just above the fourth decile.

Their OPI scores showed both similarities and some differences. In general, the student with the higher grades tended to score above average on the M.M.P.I. scales; the other student tended to be about average and below; as seniors, they were both about average. The student with the higher gpa scored below average on the scales measuring "Tolerance-Complexity," and increased his scores on two scales, Thinking Introversion (Ti) and Originality (O) in the next four years. The other student was considerably above average on Ti and O on both occasions and increased his score on Complexity of Outlook (Co) during the college years. Both students were about average for our group on the authoritarian scales (Fa and Sm), with the student having the higher gpa being slightly above average, and the other slightly below. Finally, the student with the higher gpa scored above average on the Impulse Expression scale on both occasions, whereas the other student changed from 1 sigma below to 1 sigma above the mean.

One wonders whether the traits measured by Thinking Introversion, Originality, and Impulse Expression are important conditioning factors in academic achievement as measured by grades. The student with the greater originality and tendency towards interest in ideas had the lower grades. Further study of other students may provide further clues.

We hope to make systematic analyses of a number of individual students somewhat along the lines of the two just described, believing that the evidence from case studies will supplement and complement the evidence from group analyses. For a considerable number of students we shall be able to

enrich the test data by means of information obtained through interviews.

The Myers-Briggs Type-Indicator was administered at the end of the fourth year of the investigation. A number of analyses are in progress but not much can be reported as yet. The distributions of Types for our subjects differ from those found for a group of over 2,000 students in liberal arts. For instance, we find a larger percentage of introverts and intuitives among the National Merit students than was reported for the liberal arts students. Similarly, we have a larger percentage of intuitives and judgmental types among our engineering students than among over 2,000 engineering students for whom data are reported in the manual. The distributions by Types for our academically superior students are quite similar to those found for a group of creative men.